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<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/813,802	CIBOTTI, GLEN J.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Steven J. Ganey	3752	

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**  
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed September 11, 2006.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                      |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|  | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. The application has been amended as follows:

In the claims:

Claim 1, line 2, the word --holder-- has been inserted before the word "body".

Claim 1, line 5, the word --holder-- has been inserted before the word "body".

Claim 8, line 2, the word --holder-- has been inserted before the word "body".

The above changes were done to provide proper antecedent basis, remove double inclusion issues and clearly define the invention by separately claiming a "nozzle holder body" and a "nozzle body". Similar language was used in claim 14.

3. The following is an examiner's statement of reasons for allowance of claims 1-7: The prior art did not teach or suggest a fuel injector as claimed by the applicant, specifically a fuel injector comprising a needle valve having oppositely disposed tip and head ends, wherein the head end having an outside surface received within the needle guide and axially interrupted into outside surface upper and lower portions by a first control volume having second upper and second lower metering edges, the head end defining a fuel passage communicating between the first control volume and the needle bore axially below a bottom edge of the outside surface lower portion, the needle guide having a greater diameter than the nozzle seat to provide a differential

area for hydraulically moving the needle valve away from engagement with the nozzle seat, the fuel inlet control volume being connected to receive periodic high pressure pulses of fuel for opening the needle valve against a closure bias, when the needle valve is in the closed position, the first upper metering edge and the second lower metering edge are axially spaced to define a circumferential fluid flow clearance and the lower needle guide portion axially overlaps with the outside surface lower portion, the axial overlap being great than or equal to an axial dimension of the fluid flow clearance, whereby initial movement of the needle valve is produced by fuel flowing through the fluid flow clearance and the fuel passage to the needle bore, together in combination with the other claimed features of applicant's invention.

4. The following is an examiner's statement of reasons for allowance of claims 8-13: The prior art did not teach or suggest a fuel injector as claimed by the applicant, specifically a fuel injector comprising a guide surface interrupted by a first control volume to define an inner metering ring intermediate the groove and the tip, the inner metering ring having an external metering surface between axially spaced upper and lower metering edges, the needle valve defining a fuel passage communicating between the first control volume and the needle bore axially below the inner metering ring, the needle guide having a greater diameter than the nozzle seat to provide a differential area for hydraulically opening the needle valve against the bias of the closure spring the inner metering ring, with the needle valve in its closed position, being received within the outer metering ring with the inner metering ring lower metering edge below the outer metering ring upper metering edge by an axial overlap greater than an axial clearance between the inner metering ring upper metering edge and an upper terminus of the fuel inlet control volume, wherein the needle valve is initially opened by fuel flowing through a first fluid

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flow path defined by the axial clearance, the groove and the fuel passage into the needle bore below the inner metering ring, together in combination with the other claimed features of applicant's invention.

5. The following is an examiner's statement of reasons for allowance of claims 14 and 15: The prior art did not teach or suggest a fuel injector as claimed by the applicant, specifically a fuel injector wherein the needle valve defines a fluid passage radially inwardly through an outside surface of the head and axially downwardly toward the valve stem, the needle valve cooperates with the nozzle holder body to define a variable control volume surrounding the valve stem and alternative pilot and primary fuel flow paths being defined between the fuel inlet passage and the control volume, the pilot fuel flow path extending from the fuel inlet passage through the fluid passage, the primary fuel flow path communicating directly between the fuel inlet passage and the control volume, the pilot fuel flow path being open when the needle valve is in the closed position and for a pre-determined initial axial movement of the needle valve away from the nozzle seat and opening the primary fuel flow path requires axial needle valve movement through an intermediate valve position in which the pilot fuel flow path is closed, together in combination with the other claimed features of applicant's invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

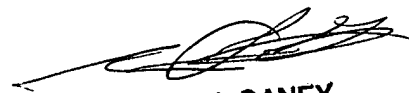
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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Ganey whose telephone number is 571-272-4899. The examiner can normally be reached on 7:00-5:00; M, Tu, W and Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Shaver can be reached on 571-272-4720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sjg  
3/1/07

  
STEVEN J. GANEY  
PRIMARY EXAMINER  
3/1/07